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Social Comparison and Persuasion Processes in Health Communications

Jerry Suls and Kathryn Bruchmann

Abstract

Two basic social processes, persuasion and social comparison, have figured prominently in the development and implementation of health communications since the early 1950s. This chapter reviews relevant theory and evidence from basic persuasion and comparison research to demonstrate the centrality of the self-concept for understanding changes in personal belief, opinion, self-efficacy, and behavior change. Then, selective evidence and implications from health communications research are reviewed: Interventions using self-affirmation; gain-loss framing and graphic warning labels/fear appeals from the persuasion area; and interventions using normative provision, social comparison interventions, and support groups from the comparison area. In the final section, personalized, tailored health-communication approaches that capitalize on both persuasion and comparison paradigms are described. For intervention and public-policy purposes, it is recommended that communications that increase personal relevance, cognitive elaboration, and assimilation to health role-models have the strongest potential for creating lasting health behavior change.

Key Words: social comparison, persuasion, elaboration likelihood, self-affirmation, gain-loss framing, proxy model, self-efficacy, tailored communications, fear appeals

In health communications, people are urged to engage in physical exercise, maintain nutritious and appropriately sized diets, obtain inoculations, avoid cigarettes, undergo screening procedures and take recommended medications. In the early 1950s, social psychologists, whose specialties were in attitude measurement and persuasion, were among the first behavioral scientists to consider the best ways to design and disseminate health communications to inform and persuade the public to adopt healthy—and avoid unhealthy—practices. As basic social psychology has advanced, its contributions to health communication also have expanded. Additionally, the means by which health messages are communicated have grown from just face-to-face, magazines, newspapers, billboards, or radio to include television, social media, and the Internet.

This chapter describes how knowledge about basic social psychological processes has informed the development and application of effective health communications. The coverage will be selective and focus mainly on two core social psychological areas that frequently work in tandem: persuasion and social comparison processes.

Defining Terms and Describing Overlap

Persuasion refers to the process whereby written or spoken words are used to communicate information, feelings, and/or reasoning toward some event, idea, object, or other person(s) (Seiter & Gass, 2010). Facts, arguments, and testimonials are used to sway opinion. Social comparison is defined as the process of thinking about information about one or

more other people in relation to the self. Relative standing can be informative about what one is capable of doing and whether one's personal opinions and beliefs are correct (Festinger, 1954a&b; Wood, 1996). The comparison process is assumed to operate mainly when people do not have objective information available to gauge their standing and uncertainty is high (cf. Klein, 1997). Comparison can be a deliberative process, but it can also occur unconsciously or implicitly. Persuasion and comparison are usually treated as distinct processes, but they need not be.

One common scenario that combines persuasion and comparison occurs when one learns the results of an opinion poll, overhears someone state his or her view, or infers another person's opinion from overt behavior. Under these circumstances, it would be surprising that comparison of one's personal views with another person would not occur, at least implicitly. Even in the absence of supporting information or arguments, mere exposure to another's person position on some issue may be sufficient to induce attitude change, or, if one learns one's opinion is shared, bolster confidence. Persuasion, on the other hand, involves not just learning about some person, group, or organization's opinion (i.e., level of agreement or disagreement), but also being exposed to facts and arguments that sustain their position.

Comparison may be integrally connected to persuasion when the communication source's relative standing with the target audience on relevant attributes is salient. For example, while listening to a political appeal, a message is generally more persuasive when it comes from someone of the same political party (e.g., Brock, 1965). Similarly, a common assumption is that a persuasive message from a person who is similar to the audience in gender, age, or life experience, lends credibility to the content of the communication. These examples provide a preliminary illustration of the interconnectedness of persuasion and social comparison. This is a common occurrence in health communications, although, in some cases, the social comparison elements are implicit and unacknowledged. This chapter will further parse the relationships between these theories in health communications.

Lessons from Persuasion

In the earliest days of persuasion research, attitude change was conceptualized in terms of learning theory or information processing. The Yale approach, led by Carl Hovland, proposed that persuasion is

contingent on a sequence of stages: attention, comprehension, learning, acceptance, and retention of the information in a communication (Hovland, Janis, & Kelley, 1953). A persuasive appeal is successful to the extent that the message and its conclusion were attended to, understood, accepted, and later recalled (McGuire, 1968).

Laboratory-based research involved testing manipulations thought to be relevant for particular information processing stages. For example, source credibility can be relevant to all stages, whereas comprehension seems especially affected by the complexity of the message. Health communicators initially adopted manipulations found to be successful in laboratory research, such as source credibility and incentives for adopting recommendations.

One type of incentive, based on fear-based conditioning, was borrowed from learning theory. Fear was conceptualized as a drive state motivating trial-and-error behavior to reduce the drive (e.g., Janis, 1967). In persuasion, fear arousal was presumed to enhance message acceptance when the message also prompts mental rehearsal of the recommended precaution that reduces the fear (Janis, 1967). For example, a campaign might provoke fear by describing a threat to which the target is susceptible (e.g., depictions of serious automobile accidents), followed by description of safety conditions produced by protective action (e.g., "always buckle-up to reduce the risk of serious injury"). In amended form, this idea is the basis for contemporary public campaigns in Europe and the United States featuring graphic warning labels on cigarette packs (e.g., Hassan, Shiu, Thrasher, Fong & Hastings, 2008), which will be discussed in more detail later.

Although attitude change conceived as a learning phenomenon was the foundation for extensive research and provided supportive evidence for the use of several persuasion strategies, the approach had limitations. Researchers studying fear-based appeals found that high levels of fear may instigate defensive processes, such as derogation of the communication source or denial of the message content, and thereby often were ineffective. Fear was effective only when the audience had a viable and available plan or strategy to control the danger (Leventhal, Singer, and Jones, 1965).

Notably, the premise of the Yale approach that persuasion produces new learning was not strongly supported. For example, the amount of information presented in the persuasive message that the target can recall tends to be poorly correlated with degree of attitude change (Petty, Ostrom, & Brock, 1981).

Also, some influence targets attend and comprehend the message and change their minds, whereas other targets also attend and comprehend, but do not change. These results do not provide strong support for the learning or information-processing framework.

Among contemporary social psychologists, there is consensus that it is not merely the information that people attend to or comprehend but also what they cognitively "do" with the information that affects the degree to which persuasion occurs. In other words, persuasion depends on *how* the content of a persuasive message is cognitively processed, an insight that forms the basis of the influential elaboration-likelihood model of persuasion (ELM; Petty & Cacioppo, 1981). For ELM, how motivated and able people are to assess the central merits of an issue or a position is the critical element. Some motivational and ability variables are part of the persuasion situation, whereas others are individual attributes. The more motivated and able people are to assess the merits of an issue or position, the more likely they are to effortfully scrutinize issue-relevant information.

When elaboration likelihood is high, people will thoughtfully assess the communication in relation to knowledge that they already possess and arrive at a reasoned attitude that is well-articulated and bolstered by supporting information. Deliberative cognitive processing may elicit thoughts supportive of the message, but also be met with self-generated counterarguments. The predominance of supportive thoughts over counterarguments will determine whether the message is persuasive. This is considered the *central route* of persuasion. When elaboration likelihood is low, information scrutiny is reduced and attitude change can result from less resource-demanding processes that do not require as much effortful evaluation; this is referred to as the *peripheral route of persuasion*.

Attitudes that are changed by low (rather than high) effort are assumed to be weaker and have less impact on behavior than attitudes that are changed the same extent by high effort. Whereas high elaboration may involve careful deliberation about the accuracy and reasonableness of the facts and arguments presented in the message, low elaboration involves the use of peripheral cues; for example, simply counting the number of arguments and assuming that with "so many arguments, it must be good," or that if a physically attractive source advocates the product, "it must be worth purchasing" (Petty & Cacioppo, 1984).

An important variable affecting an individual's motivation to "elaborate" is the perceived personal relevance or importance of the communication (Petty & Cacioppo, 1979; 1986; Johnson & Eagly, 1989). When the issue's personal relevance is high, people are more influenced by the substantive arguments in a message and are less impacted by peripheral cues, such as source attractiveness (e.g., Petty, Cacioppo, & Goldman, 1981). There also are individual differences in people's motivation to think about persuasive communications. Those who enjoy thinking are described as being high in "need for cognition" (Cacioppo & Petty, 1982), and tend to form attitudes on the basis of the quality of the arguments in a message rather than on peripheral cues (see Cacioppo, Petty, & Morris, 1983).

There is a long list of relevant persuasion variables identified by attitude researchers, such as source credibility, message complexity, and message repetition, but the persuasion topic's personal relevance appears to be the superordinate construct. Topic relevance is defined by the self-concept—the personal attributes and issues an individual considers to be self-defining, the life domains that are most dear and desirable goals and aspirations. When a persuasive message has resonance for the self-system, then deliberative cognitive processes are set in motion.

Fear-Appeals Redux

Because threat or fear figures prominently in health communications, it may be worthwhile to consider the way current attitude researchers think about them. To anticipate our argument, the self also has a prominent role. Several reviewers observe that fear per se does not distinguish between effective and ineffective interventions (Fisher & Fisher, 1992). This may be because fear triggers two qualitatively different motivational processes (Leventhal, 1970). First is *fear control*, which involves reduction of a threat through derogation of the source and defensive processes, such as denial. However, this kind of control does nothing to actually lessen the threat. *Danger control*, the second process, elicits cognitive processes to instigate protective actions to actually avoid the threat. Fear control and danger control can act independently or in tandem (Leventhal, 1970). The protection-motivation model (Rogers, 1975) posits that danger control consists of a threat appraisal component ("how serious and how personally susceptible am I") and a coping appraisal (assessment of effectiveness of potential responses [outcome expectancies] and personal ability to perform actions successfully) (Maddux & Rogers,

1983; Rogers, 1975; see also Witte, 1992; Witte & Allen, 2000).

In the absence of feelings of outcome-efficacy and self-efficacy (Bandura, 1986), threat induces fear control rather than precautionary behavior. However, with appropriate reassurance that there are actions that can prevent the dire event and the belief that one is capable of such actions, then precautionary behavior (i.e., danger control) should follow (Ruiter, Kok, Verplanken, & Brug, 2001).

The role of susceptibility, outcome-efficacy and self-efficacy demonstrated in fear appeals dovetails with the more general idea that persuasion and behavior change require the engagement of the self-system. If the message recipient believes the personal susceptibility to injury or illness is negligible, then the message has little personal relevance. If there is no potential precautionary action or if self-efficacy is perceived to be low, then the precautionary action is unlikely.

Attitudes and Behavior. ELM researchers have been most concerned with persuasion and attitude change and less with the relationship between attitudes and behavior (the conspicuous exception being the idea that central processing is more likely to have greater impact on attitudes and subsequent behavior). The most influential explanation for the attitude-behavior relationship is Ajzen's Theory of Planned Action (TPA; Ajzen 2001; Ajzen & Fishbein 2005), which postulates that behavior follows from both behavioral intentions and perceived control over behavior. Intentions are derived from considerations of attitudes, subjective norms (i.e., what relevant referent groups support), and perceived behavioral control (i.e., self-efficacy). A meta-analysis showed that intentions explained a significant portion of variance (18%) in subsequent behaviors, and subjective norms were the weakest predictor (13%) (Armitage & Conner, 2001). Another meta-analysis found that intentions only predicted 28% of the variance in actual behavior leaving much that is not accounted for; however, few studies have assessed actual behavior (Sheeran, 2002).

An implicit assumption of some researchers is that the constructs in the TPA operate sequentially (with perceived control following the other constructs). However, concerns about poor outcomes or low self-efficacy may give rise to counterarguments even during initial processing of a persuasive message. People often can quickly discern the implications of changing their opinions for subsequent action. This means that assessing self-efficacy as low

while the persuasive message is cognitively processed may place the brakes on the ongoing elaboration of the message. This is consistent with the idea that there are several evaluative mechanisms that operate relatively independently (Giner-Sorolla, 1999; Ito & Cacioppo, 2001); the processing of attitude objects can occur at lower, more automatic levels, whereas higher-level processing can focus on other features of the attitude. Because there is a natural tendency to protect the self-system, the individual may automatically "move ahead" to questions, such as "am I capable to preventing this threat?" even before the entire message has been read or heard. If the individual perceives low self-efficacy, then processing of the message may be short-circuited by counterarguing with the message points and/or derogating the source. This means that outcome expectancies and self-efficacy are relevant to virtually any persuasive message that has personal relevance—not just those eliciting fear.

Lessons from Social Comparison

Social comparisons can involve an unlimited range of domains, from personal income and physical attractiveness to physical health and political preferences, but comparisons only have impact when they serve self-evaluation or self-enhancement. Self-evaluation (Festinger, 1954a&b) refers to people's desire (a) to know what they are capable of doing (i.e., ability) and (b) to hold beliefs and values that are correct. Comparisons with peers, role models, and norms can provide such information. In the health domain, comparison provides information about medical risks, identifies behaviors that are health-promoting and health-damaging, and clarifies whether the individual has sufficient ability to perform the requisite behaviors. Self-enhancement refers to the desire to feel better or protect oneself from the consequences of threatening information (Wills, 1981; Wood, Taylor & Lichtman, 1985). This motive is relevant to health because the occurrence or prospect of personal illness and its consequences are inherently threatening to the physical and psychological well-being of the self. As described later, strategic incorporation of social comparison information in health communications can buoy self-esteem to facilitate the marshaling of personal resources, coping, and adoption of health-promotive behaviors.

Self-Evaluation

For self-evaluation, comparison tends to be with someone who is similar to an individual on

attributes related to and predictive of the dimension to be evaluated (referred to as *related attributes*). Thus, a patient gauging his or her physical health status should seek a comparison standard with patients with the same disease, of the same age, gender, height, and weight and those who engage in similar health practices. The patient ought to function about the same as this comparison standard, but if functioning better than the standard, the patient can infer better health. Comparing along related attribute dimensions allow us to get a better understanding of our personal situation (Goethals & Darley, 1977).

Some times, however, people want to know more than simply that they are in good or poor health, but what they are capable of achieving ("Can I do X?"). For example, chronic illness patients want to know whether they will get better or worse: "Can I return to my 40-hour a week job?" "Am I again able to play sports with my children or peers?" and so on. One way to answer such questions is to compare with someone—referred to as a proxy—who seems to have a similar level of ability and who has already succeeded at the task (Wheeler, Martin, & Suls, 1997). If people have the same amount or more ability than the proxy does, they can conclude with some confidence that they could also do as well.

There are two ways that people can be confident that they have as much potential as the proxy: (a) they previously have fared as well as the proxy at his best, or (b) they observed how well the proxy is doing and are similar to the proxy on attributes related to their physical and psychological well-being. In either scenario, they can establish with some certainty that they are similar in ability to the proxy and thus should have the same action possibilities. For example, finding a proxy who also has the same physical illness, about the same age, background, etc., and successfully returned to work a few weeks after hospital discharge.

Questions about health status and chances of recovery are important, but laypeople and patients also have uncertainty about medical procedures, medications, and other health-related matters that can be answered via comparison. In opinion comparison, it is useful to distinguish between beliefs, which refer to verifiable facts, and values, which are personal preferences (Goethals & Darley, 1977). Whereas comparisons with similar others on related attributes, such as background and general world-view, can serve for value assessment, someone who is dissimilar or, in particular, someone who is superior on related attributes (conferring more expertise)

should be more informative about beliefs. Since few facts are completely value-free, someone who has more expertise and also shares the same basic values (i.e., world view) is probably most preferred. Such a person can be considered as a "similar expert" (Suls, Martin & Wheeler, 2000). There is also a third type of opinion, which concerns predictions about subjective responses to future situations (e.g., "Will I like my new physician?"). We can predict our likely future response to a new physician by learning about a proxy's response to the same physician if proxy shares related attributes or past pattern of agreement about medical doctors.

Self-Enhancement, Contrast, and Assimilation

The kinds of comparisons just described are driven by epistemic need, but as noted earlier, they also can be hedonically driven. A popular theory, downward comparison theory (Wills, 1981), proposed that, under threat, people will prefer to compare with others who are worse off to feel better about themselves. Subsequent research showed that medical patients, who presumably experience threat, seemed to benefit from downward comparisons (i.e., with patients worse-off) (Wood, Taylor & Lichtman, 1985). This was presumably because the *contrast effect* (i.e., displacement from a worse-off target) produced a positive change in feelings about the self (e.g., Morse & Gergen, 1970). Conversely, if someone is exposed to an upward comparison (i.e., superior other), then feelings should be contrasted or displaced downward, and create worse feelings about one's standing (Wheeler & Miyake, 1992).

With the accumulation of more evidence, we know receipt of downward comparison does not always lead to positive feelings via contrast. In fact, we know that comparison also can lead to *assimilation*, that is, displacement of feelings toward the target (e.g., Brown, Novick, Lord, & Richards, 1992; Buunk, Collins, Taylor, VanYperen & Dakof, 1990; Collins, 1996; Suls, Martin & Wheeler, 2002). This means that there are four possible outcomes of social comparison: upward contrast (i.e., negative feelings from feeling different and inferior), upward assimilation (i.e., positive because one may improve and become more like the comparison other), downward contrast (i.e., positive because one is different and better than the other), and downward assimilation (i.e., negative because one identifies with the inferior other and is concerned about faring poorly oneself). What factors determine which particular outcome follows social comparison?

The theory of selective accessibility (Mussweiler, 2003), based on concepts from the social cognition literature, provides a plausible and coherent explanation. At the moment of exposure to a novel stimulus, people make rapid, holistic impressions based on salient features. In the comparison scenario, a person makes a tentative and rapid judgment of similarity or dissimilarity to the (superior or inferior) comparison target. Salient features (such as gender, race, or age) of the comparison target determine this initial impression. Then, the person searches for information consistent with the preliminary judgment (or hypothesis) of similarity or dissimilarity. Whether one searches for similarity information or dissimilarity information, it is easy to find information that is consistent because self-concepts are remarkably rich and complicated. That information then becomes selectively accessible when we make judgments about ourselves. If we have searched for information that we are similar to the standard, we are likely to assimilate our self-evaluations toward the target. If we have searched for information that we are dissimilar to the target, we are likely to contrast our self-evaluations away from the target.

Contrast is more likely if the standard is extreme or unattainable, or if the standard belongs to an out-group, both of which would lead to an initial hypothesis of dissimilarity. Assimilation is more likely to occur if there is psychological closeness with the standard, which would lead to a search for similarity. The selective accessibility model (SAM) is elegant and explains a wide variety of empirical results; however, a shortcoming of the model is that it does not explicitly recognize that self-enhancement or protection may bias comparisons. For example, there is abundant evidence that people assimilate upward, but there is almost no evidence of true downward assimilation (Wheeler & Suls, 2007). Although SAM would argue that upward and downward assimilation are equally likely, SAM could be modified slightly and state that one would not search for similarity with a downward standard because of self-esteem concerns.

In brief, (1) relative standing is discerned with related attributes in mind, (2) estimating what one's potential (i.e., self-efficacy) depends on finding an appropriate proxy (similar in related attributes and already attempted "X"), and (3) assimilation/contrast with upward or downward targets depends on the initial holistic impression of similarity/dissimilarity that triggers cognitive processes, which tend to confirm the initial impression.

Health Communications Based on Persuasion Principles

Persuasion theory and research indicate that a message needs to be personally relevant and in some way "self-defining," so as to engage elaborative processing. At the same time, virtually all health messages create some threat that may raise personal concerns about response efficacy and self-efficacy and thereby encourage counterarguing, which may lower the effectiveness of the appeal. Researchers have used theory-based approaches to optimize processing but to minimize defensiveness of health communications. Three such approaches are described next.

Self-Affirmation

One strategy to increase receptiveness to potentially threatening health messages involves self-affirmation. This refers to the process whereby people are asked to reflect on their important values or cherished attributes, which is hypothesized to engage a more open-minded and balanced appraisal of threatening information (Sherman & Cohen, 2006). In laboratory research, having participants self-affirm (e.g., describe why their most important values are relevant to their lives) counters effects of later performance failures or decisional regret (Steele, 1988). According to self-affirmation theorists, self-defense involves general sense of self-worth; thus, affirming one aspect of the self can buffer a threat in a different domain (Blanton, Cooper, Skurnik, & Aronson, 1997). In the context of persuasive messages, self-affirmation should increase central-message processing (Correll, Spencer & Zanna, 2004), which would potentially produce more attitude and behavior change (assuming the influence target generates few counterarguments).

Several successful applications of self-affirmation to health communications have been reported. Self-affirmation increased message acceptance and behavioral intentions and reduced denial about the self-relevance of health messages about skin cancer and sun safety (Jessop, Simmons, & Sparks, 2009), safe sex, daily coffee consumption to prevent fibrocystic breast disease (Crocker, Niiya, & Mischkowski, 2008), seafood consumption (Griffin & Harris, 2011), smoking reduction (Harris, Mayle, Mabbott, & Napper, 2007), heavy drinking (Napper, Harris & Epton, 2009), and HIV risk (Sherman, Nelson, & Steele, 2000). There also is evidence that self-affirmation can undo the negative effects of unrealistic optimism on colorectal cancer screening intentions (Klein et al., 2010). Although some

studies involve convenience (college-student) samples, community residents also have been recruited and similar benefits of self-affirmation obtained.

A limitation concerns a paucity of results demonstrating an effect of self-affirmation on actual behavior change. An exception (Epton & Harris, 2008) collected a baseline measure of fruit and vegetable consumption and then assigned women in the United Kingdom to a self-affirmation manipulation (versus control: opinions on unrelated issues) prior to reading a message about the health-promotive effects of increased consumption of fruits and vegetables. Behavior was assessed by having participants subsequently complete a 7-day diary concerning fruit and vegetable consumption. Measures of response efficacy and self-efficacy were also collected. Results showed that self-affirmed participants consumed 5.5 portions more than the control group (i.e., more than one day's worth of fruits and vegetables). Although self-affirmation was associated with increases in response efficacy (i.e., eating more fruits and vegetables will improve my health) and self-efficacy (i.e., "I can eat at least 5 portions each day"), only changes in response efficacy mediated the improvements in consumption.

These results indicate that self-affirmation has the potential to enhance persuasive appeals. There is a need, however, to extend the range of health behaviors tested and to clarify whether and how self-efficacy can contribute to health-behavior change.

Gain and Loss Framing

According to prospect theory from decision-science (Tversky & Kahneman, 1981), whether a health message is framed in terms of gains or losses has consequences for changing attitudes and behavior (Rothman & Salovey, 1997). For example, Mann, Sherman, and Updegraff (2004) used the following gain-framed message: "Flossing your teeth daily removes particles of food in the mouth, avoiding bacteria, which promotes great breath." The loss frame was, "If you do not floss your teeth daily, particles of food remain in the mouth, collecting bacteria, which causes bad breath." According to decision science, people tend to be risk averse when a behavior involves a potential loss, but risk preferring when a behavior involves a potential gain. A behavior is considered to be a risky or safe course of action depending on the extent to which people perceive the behavior will lead to unpleasant consequences. Choosing to perform a detection behavior, such as a colonoscopy, can be perceived as

risky because test results carry a risk of getting bad news. On the other hand, choosing to take preventive action (e.g., flossing) has little risk and affords a future of dental health.

Extending this reasoning, Rothman and Salovey (1997) predicted that gain-framed health communications are more effective for instigating illness-prevention behaviors, whereas loss-framed messages are more effective for detection behaviors. A large literature has tested these hypotheses in community and convenience samples (see Meyerowitz & Chaiken, 1987; Rothman, Wlaschin, Bartels, Latimer, & Salovey, 2008; Schneider et al., 2001). A recent meta-analysis (Gallagher & Updegraff, 2012) of 94 experiments found gain-framed messages were more likely to encourage prevention behaviors ($r = .08$), especially with regard to smoking cessation, physical activity, and skin cancer prevention—consistent with the prediction about prevention behavior. Loss- versus gain-framed messages, however, had similar effects on detection behaviors, which is not supportive of the companion hypothesis. Oddly, there also were no effects on attitudes or intentions for either kind of frame.

The weak and null findings may be because some health issues engender different degrees of involvement across individuals. For example, cancer risks of sun exposure should be more important for people who work outside than for those who work in an office all day. For the latter persons, their low level of involvement should not elicit feelings of personal relevance, and, therefore, produce little message elaboration. Indeed, experiments manipulating high versus low issue involvement find stronger evidence for predictions about the effects of gain versus loss messages on detection versus prevention when high involvement is created (Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Banks et al., 1995).

Another factor concerns how people construe health behaviors as potentially yielding a pleasant or an unpleasant outcome (Rothman et al., 2008). In the case of most medical screening procedures, the prospect of potentially bad news looms large, so loss-framed messages have the persuasive advantage. That, however, need not be the case. Users of university health services were more persuaded by a gain-framed message recommending a test for an enzyme described as detecting a health benefit, but users were more persuaded by a loss-framed message when the enzyme was described as a health problem (Bartels, Kelly, & Rothman, 2010). In sum, health communicators need to be attentive to levels of issue involvement and to how people construe

health behaviors to elicit the distinctive effects of gain- and loss-framed messages.

A third factor related to the effects of gain- and loss-frame messages concerns the degree to which the individuals are dispositionally oriented toward approach motivation, which is analogous to promotion, versus oriented toward avoidance motivation, which is analogous to prevention (Higgins, 1999; Elliot & Thrash, 2002). For instance, people may increase their physical exercise either because they want to improve their health (representing approach orientation), or to avoid becoming overweight (representing avoidance orientation). As in previous sections, the self-concept is relevant because these different motivations reflect the “desired self” versus the “feared self.” This leads to a matching hypothesis, that persuasion and behavior change should be maximal when the person’s motivational orientation matches the message frame.

Consistent with the matching hypothesis, persons with dispositional approach motivations were more persuaded by a gain-framed communication about dental flossing or physical exercise, whereas those with avoidance motivations were more persuaded by loss-frame communication (Mann et al., 2004; Latimer, et al., 2008).

This research also has cultural implications for the effectiveness of health communications in an increasingly diverse society. Individualistic cultures, such as the United States and most European countries, are said to emphasize promotion and sensitivity to positive outcomes; whereas collectivistic cultures, such as Asian countries, emphasize prevention and sensitivity to negative outcomes (Lee, Aaker & Gardner, 2000; Markus & Kitayama, 1991). This translates to predicting that communicating potential gains or benefits of a health behavior should be more effective for persons in individualistic societies. However, a loss frame should work better in collectivistic cultures at encouraging behavior changes. These predictions have received support in the areas of dental hygiene (Uskul, Sherman & Fitzgibbon, 2009) and caffeine consumption (Uskul & Oyserman, 2010).

Fear Appeals and Graphic Warning Labels

Due to the concerns about eliciting denial or defensiveness found in research, public health officials in the United States have tended not to utilize graphic depictions of the effects of illness or risk behaviors to the degree that was popular in earlier decades. There is one area of public health, however, where graphic images have been advocated—on

cigarette-pack warning labels. Since 1960, the federal government has instituted warning labels, including statements, such as: “Caution: Cigarette Smoking May be Hazardous to Your Health,” or “Surgeon General’s Warning: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy.” In Canada, Australia, and some European countries, however, recent government regulations require larger and more specific warnings (e.g., “Cigarettes cause lung cancer. 85% of lung cancers are caused by smoking and 80% of lung cancer victims die within three years.”), accompanied by images, such as a picture of a human lung detailing cancerous growths. Lobbying by health organizations encouraged the passage of the U.S. Family Smoking Prevention and Tobacco Control Act of 2009, which requires color graphics with supplemental text that depicts the negative consequences of smoking to cover 50% of the front and rear of each pack. Currently, this directive is being challenged in the courts with tobacco companies claiming the new regulations infringe on their right to free speech.

There is much evidence favoring the use of graphic warning levels (e.g., Borland, & Hill, 1997) and results continue to be released from the International Tobacco Control Four Country Survey Study conducted since 2002 (Canada, Australia, United Kingdom and United States) to evaluate the effects. Most of the available evidence indicates that exposure to graphic labels leads to enhanced knowledge about smoking risks and increased interest in quitting (e.g., Li, Borland, Yong et al., 2012). A panel study conducted in Canada demonstrated that smokers who had read, thought about, and discussed the new labels at baseline were more likely to have quit, made a quit attempt, or reduced their smoking three months later (Hammond, Fong, McDonald, Cameron, & Brown, 2003).

These results seem to contradict the earlier research suggesting that high fear is ineffective unless people also perceive they have resource options and self-efficacy. However, graphic warning labels have an advantage that billboards and media messages do not—smokers invariably see the gory imagery every time they take a cigarette out of its pack. Also, the public health community in Canada may have promoted cessation aids so widely, in combination with the graphic labels, that people are successful at quitting. Alternatively, perhaps smokers who intend to quit are likely to pay attention to the labels, although the prospective associations do not favor this explanation (Hammond et al., 2003).

For the purpose of balance, quitting and quitting *permanently* are quite different; relapse in 3–6 months is common, so the long-term benefits of graphic warnings await further confirmation. Nonetheless, research on self-quitters shows that after two or three attempts, many smokers acquire sufficient knowledge and skills to give up the habit permanently (Schachter, 1982, cf. Cohen et al., 1989). Another reservation is that some people tend to question the authenticity of the imagery in warnings and assume the images have deliberately been distorted, which is suggestive of denial or defensiveness described earlier (McCool, Webb, Cameron, & Hoek, 2012).

These concerns lead us to conclude that graphic warning labels should be most effective if they also provided information about how to contact a telephone quit line that offers concrete strategies and assistance in quitting and resisting relapse. In this way, threat can be handled by providing reassurance about response options and personal self-efficacy.

Fear and Framing. Some researchers (Cameron & Chan, 2008) have advanced the idea that fear arousal should enhance the impact of loss-framed messages but detract from gain-framed messages. The prediction about fear and loss framing has been tested and confirmed by Gerend and Maner (2011). These researchers proposed that people should be more motivated to adhere to behavior change recommendations if they receive a message consistent with their current motivational state. Consequently, inducing fear, with its concomitant focus on risk and threat, should produce more responsiveness to a loss-framed message. In their study, undergraduates completed a baseline assessment of fruit and vegetable intake followed by an emotion-induction task. Then they read a gain- or loss-framed pamphlet promoting more fruits and vegetable and provided tips about how to implement the recommendations. Then, two-weeks later, participants completed another assessment of fruit and vegetable consumption. Those who had received a fear induction showed more adherence to the recommendations communicated with a loss frame. Interestingly, inducing a different type of negative emotion, anger, did not have this effect (see Gerend & Maner, 2011).

Empirical Evidence on Health Communication Based on Social Comparison

Social-Norm Campaigns

There have been several ways that the power of social comparisons has been harnessed by health communications to recalibrate norms and standards

related to health and motivated behavior change. One method capitalizes on how comparisons concerning relative standing with peers provide information about appropriate beliefs and practices. Surveys and interviews with community-residing adults demonstrate that people worry and act on their level of personal risk when they believe or are informed they are at higher risk than their peers (Dillard, McCaul, Kelso, & Klein, 2006; Lipkus & Klein, 2006). In one such study (Lipkus & Klein, 2006), community residents were recruited and stratified to high- and low-risk groups for colorectal cancer, based on the presence or absence of actual risk factors. They also were informed that they had more than the average number of risk factors of a group of 100 other people also tested *or* they received no risk information. Those informed they were higher in comparative risk had the highest intentions and were more likely to undergo colorectal screening. Of note, recent websites that are designed to provide people with information about their disease risk in order to promote behavior change (e.g., Your Disease Risk website (<http://www.yourdiseaserisk.wustl.edu/>)) have chosen to provide feedback in a comparative framework.

Besides campaigns that communicate health risks, it has become a common practice to provide social norms about health behavior practices, such as alcohol consumption and smoking (Perkins, 2002). The premise is that the public often overestimates the prevalence of unhealthful practices, such as problem eating or problem drinking, because just a few extreme episodes are so memorable and thereby distort the perceived norm about how most people behave (Suls & Green, 2003; Bourgeois & Bowen, 2001). Campaigns providing actual behavioral norms to correct norm estimates to discourage unhealthy practices (e.g., Agostinelli, Brown, & Miller, 1995) have had some success. However, the extent to which wide-scale dissemination of norms can successfully inculcate healthier practices is unknown. Whereas bingers might reduce their drinking to behave more like the “average,” people who are temperate, upon learning the “norm,” may shift to become less temperate (Hansen & Graham, 1991; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). In other words, providing norms in community campaigns might actually backfire for some persons.

Health Communications Using Comparison with Patients

In medical settings, it is not uncommon for patients with acute or chronic illness to be

exposed to health communications that involve social comparisons. Prior or following surgery, patients may be asked to view videotapes depicting the procedure and its sequelae and what practices should be followed postdischarge. Often, these videotapes feature real patients or actors posing as patients who describe their experiences. More informal health communications may be transmitted in patient support groups where some comparisons may be implicit and explicit. Theory and laboratory research described earlier has been applied to coping in acute and chronic illness patients.

Whether comparisons are associated with better or worse responses depends, in part, on how patients construe their likelihood of improvement or decline (Lockwood & Kunda, 1997; see also Mussweiler, 2003). If people perceive they can improve, they cognitively search for similarities with a patient who is better off, leading to upward assimilation. If they do not believe they are capable of improvement, they search for differences with the fortunate target, leading to downward contrast. If people think they may become worse, then they will search for similarities with a less fortunate patient, resulting in downward assimilation. Finally, if they think they can get better, then they should search for differences with the less fortunate, producing upward contrast. Experimental studies tend to support these predictions with one exception: Downward assimilation is rarely seen (Wheeler & Suls, 2007), probably because most people are highly motivated to avoid thinking about the prospect of getting worse so motivation trumps belief about a possible decline.

Some people, however, may be temperamentally inclined to be optimistic or pessimistic. Cancer patients who score high in neuroticism respond unfavorably to learning about both more and less fortunate patients (Van der Zee, Oldersma, Buunk, & Bos, 1998). Because neurotics tend to have a negative outlook, including low expectations about the future, their poorer responses to any kind of comparison is understandable.

An illustrative study found most patients try to make the best of comparisons (Stanton, Danoff-Burg, Cameron, Snider, & Kirk, 1999). Breast cancer patients listened to an interview with a (supposed) patient whose comments reflected good, poor, or unspecified psychological and physical status. Listening to the poorly adjusted patient led to higher self-ratings of adjustment than listening to a well-adjusted patient, although even the

latter group rated adjustment and prognosis as better than that described by the patient in the interview. There were apparent benefits from exposure to better off or worse off patients, but assimilation with a less fortunate patient was resisted.

A recent, comprehensive review (Arigo, Suls & Smyth, 2012) found that exposure to better-off patients produces more favorable outcomes than to worse-off patients. However, rarely does a better-off patient produce significantly better moods or self-efficacy than exposure to a neutral control condition. We think the reason is connected to considerations described earlier about basic comparison processes: Assimilation to someone of higher standing (or lower standing) requires an initial impression of similarity to facilitate more elaborate search for additional similarities (Mussweiler, 2003). Typically, in past studies exposing patients to high-functioning comparison vignettes, there has been no attempt to highlight similarities beyond gender and age. To encourage patients to find more similarity with the target, it probably is essential to optimally match the patient's attributes and preferences with the target. Following the logic of the proxy theory and selective-accessibility theory, comparison models should be tailored to the patient's attributes to optimize the opportunity for upward assimilation.

One implication is that, as audiovisual recordings of patient models in psycho-educational interventions increasingly are being used to prepare patients for medical procedures (Mahler & Kulik, 1998), they need to be developed with careful attention to factors identified in experimental research, such as similarities to the target and perceived attainment. At the same time, basic research showing that highly neurotic patients may compare indiscriminately indicates such persons may need special interventions to counteract their generally negative expectations.

Support Groups. Health information also is communicated in Internet chat-rooms and patient support groups—settings in which social comparisons play an important role (Carmack-Taylor et al., 2007; Bunde et al., 2006). In conventional support groups, patients with a particular disease are recruited, so groups are heterogeneous in terms of distress level and disease severity. The segment of well-adjusted patients may have no need for support, but may be included to serve as role models and targets of positive assimilation, consistent with the theory and lab studies described earlier.

Combining Persuasion and Comparison in Health Communications *Tailored Messages*

Although the role of comparison processes is not always explicitly acknowledged, personalized tailored health communications, a relatively recent development, engage both persuasion and comparison processes. In the majority of past programs involving health communications, the materials consist of a "...single, generalized body of information in the form of brochures, booklets or pamphlets designed for the general population or for some demographic subgroup," (Kreuter, Strecher, & Glassman, 1999, p. 276). With the introduction of new computer technologies, persuasive messages can be quickly tailored to a target's attributes, needs, and interests. The latter personal information may, in some cases, be available in medical records, but a person's status can be self-administered, assessed by interview or administered by an interactive computer program. For example, to create a personalized tailored appeal for diet change, information is collected about age, gender, current diet, cooking skills and eating patterns (Kreuter, Bull, Clark, & Oswald, 1999). Personalized tailored materials can capitalize on personal relevance, which, in turn, prompts elaborative cognitive processes (Petty & Cacioppo, 1981).

Further, such tailoring should facilitate the kind of assimilative processing described in the proxy and selective accessibility accounts of social comparison. Even if the health communication presents facts and arguments advocating change and behavioral strategies without providing a role model or testimonial (from a real or fictitious person), the communication represents a viewpoint concerning relevant beliefs, values, and behaviors that constitute a kind of social comparison with an "idea" of a comparison target. Thus, value, belief, and preference-prediction comparison processes should be engaged, particularly when the information matches the recipient's personal attributes and current standing. The combination of assimilation promoted by elaboration and comparison should optimize persuasion.

Several empirical studies offer support for these ideas (Bull, Kreuter, & Scharff, 1999; Kreuter et al., 1999; Holt, Clark, Kreuter, & Scharff, 2000; Brug, Steenhaus, Van Assema, & De Vries, 1996). For example, adult primary-care patients were randomly assigned to receive personalized tailored materials to increase their physical activity (matched to the patients' goals, types of activities and perceived

barriers) or to receive unpersonalized generic materials. The group receiving the personalized tailored communication showed larger increases in physical activity (Bull et al., 1999). Other evidence confirms that such messages elicit greater interest, more positive self-assertions and more positive thoughts about behavior change intentions (Skinner, Campbell, Rimer, Curry, & Prochaska, 1999) than more generic, mass-produced materials.

Narrative Communication

A second way in which comparison and persuasion processes can be engaged is in narrative health communications. The health messages described in earlier sections of this chapter involve statistical evidence, probability and appeals to reason—sometimes referred to as *expository* communication. The ELM is thought to be the appropriate model for such messages. An alternative form is *narrative* communication, which employs storytelling and testimonials, and involves a different kind of processing (Green & Brock, 2000). Whereas ELM emphasizes relevance or involvement with respect to the message topic, narrative processes emphasize the degree of identification with the characters, referred as absorption or *transportation* (Slater & Rouner, 2002). This transportation, induced by a compelling narrative, is supposed to inhibit counterarguing and increase cognitive rehearsal and recall, thereby maximizing persuasion and behavior change (Hinyard & Kreuter, 2007).

In one representative study (McQueen, Kreuter, Kalesan, & Alcaraz, 2011), low-income African American women were assigned to watch a narrative video featuring stories from African American breast cancer survivors or a content-equivalent informational video about mammography. Responses were collected immediately, at 3- and 6-months. Women who watched the narrative video reported being more engaged, and reported more positive affect and less counterarguing with the appeal to seek mammograms versus those women watching the expository video. No evidence was reported about later screening although the narrative message was associated with behavioral correlates of screening. Two other studies testing the effects of narrative communication have found subsequent effects on behavior, such as blood pressure control (Houston et al., 2011) and safety (Ricketts, Shanteau, McSpadden, & Fernandez-Medina, 2010).

Our perspective about narrative communications is their persuasive power is based in part on joining persuasion and comparison processes.

To the extent a narrative persuasive appeal is able to prompt assimilation with the characters (potential proxies) then their arguments, experiences, opinions, and behaviors must appear appropriate for the audience. This means it is essential to identify the target's attributes, which create an initial holistic impression of similarity with the characters (in accord with SAM) and related attributes that give the targets confidence they can successfully implement the changes and experience positive health outcomes (in accord with the proxy model; Wheeler et al., 1997).

High-Tailored Proxy Health Interventions

Our final topic concerns novel interventions, for example for smoking cessation or diet programs that also include many of the kinds of information included in one-shot health communications (Streicher et al., 2008; see also Alexander et al., 2010). The novel elements involve testing a low-tailored versus a high-tailored smoker's story about successfully quitting plus intervention components of cognitive-behavioral therapy. In our terms, such an intervention attempts to maximize the engagement of social comparison and persuasion processes to create behavior change.

In this multifactor study (Streicher et al., 2008), smokers enrolled in two HMOs, who were considering quitting, received access to a free smoking-cessation program delivered via the web and a free supply of nicotine replacement patches. At the start, participants completed a baseline questionnaire about smoking history, demographic, psychosocial and health characteristics (this information was used to create the tailoring). Then, participants were randomly assigned to conditions that manipulated several factors in a fractional factorial design (Collins, Murphy, Nair, & Strecher, 2005). Participants assigned to the single exposure condition received all the information during one Internet session, whereas those assigned to multiple exposure received the same materials distributed over 5 weeks. High-depth *outcome expectations* participants received advice and feedback related to their specific motives reported for wanting to quit in the baseline questionnaire; low-depth participants received feedback relating to their motives, but the program did not make as many connections to their current health or lifestyles. Smokers assigned to high-depth *efficacy expectations* received information to cope with their (reported in the survey) two most problematic barriers to quitting,

whereas low-depth participants received content about barriers that was framed in broader terms. The success stories, including a profile of a successful quitter, also were manipulated in terms of depth. The high-depth participants received a story about someone of the same gender, age, ethnicity, marital status, which also included matching outcome and efficacy expectations. In contrast, the low depth participants only shared gender with the person in the narrative. Participants were contacted via telephone six months postquit date and completed a 7-day assessment of smoking abstinence.

Abstinence was strongly related to receipt of a high-depth success story. In fact, the combination of highest tailored intervention components yielded a mean quit rate of about 39%, which for a low-cost, minimal contact, population-based intervention is impressive (Lancaster & Stead, 1998). A single exposure was as effective as multiple exposures. Interestingly, depth of outcome or efficacy expectations presented in a conventional, advice style was not associated with smoking cessation, whereas this same information embedded in the success story framework was effective. As Strecher et al. (2008) observe, "...how you say it and who says it are at least as important as what you say" (p. 380).

The present authors, however, would take this further. The "how," "who," and "what" in this creative and efficacious intervention produced meaningful behavior change because a proxy was presented who shared personal characteristics, opinions, experiences, and related attributes in connection with smoking and who modeled successful health behavior change. The similarities in personal characteristics should have facilitated identification/assimilation and the matching of related attributes should have made the role model's success seem like an appropriate and approachable goal for oneself (Wheeler & Suls, 2005). Concurrently, the content and arguments conveyed through a story should have reduced counterarguing (based on narrative theory). This approach has considerable potential. Future study and implementation is needed to test the reach and effectiveness of such combined health communication-intervention efforts using the Internet as a platform.

Conclusions

Since the early 1950s, health communications have been systematically tested and implemented using several different modalities. This chapter presented a selective review of those aspects of health-communication campaigns that capitalize on social comparison and persuasion processes

elucidated by basic research. For both types of processes, engagement of the core elements of the self-system seems essential to understand coping, opinion, belief, and behavior. Persuasion theories emphasize the role of personal relevance and the self in active cognitive processing of persuasive appeals to produce meaningful behavior change. With that recognition, persuasion theory has inspired research on the effects of self-affirmation, framing, and fear. Comparison theory has motivated the development of programs to correct perceptions of social norms, identified how people use comparison to evaluate their relative standing, to assess what they can accomplish, to manage threat, and to utilize information about better- and worse-off persons or groups. Experts in health communications also have incorporated the findings and insights of this research with audiovisual materials, and social support groups designed for Internet use. Finally, the newest generation of health communications involves an integration of advances in persuasion (e.g., narrative theory), comparison (e.g., matching of personal attributes to facilitate assimilation) and clinical intervention practices, such as cognitive behavior therapy to achieve health benefits.

If the past is any indication, as persuasion and comparison theory/research continues to extend and refine its insights and strategies, health communication researchers and practitioners will import them to advance the public health. What is learned from implementation in the field will provide feedback and, no doubt, present surprising findings, as input for basic researchers (Suls, Luger, & Martin, 2010; Cialdini, 1980). So the scientific cycle will continue from "bench to bedside" and from "bedside (and community) to bench"—a dynamic, recursive loop.

References

- Agostinelli, G., Brown, J. M., & Miller, W. R. (1995). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education, 25*, 31–40.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology, 52*, 27–58.
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B.T. Johnson, & M.P. Zanna, (Eds.), (2005). *The handbook of attitudes* (pp. 173–221). Mahwah, NJ: Erlbaum.
- Alexander, G. L., McClure, J. B., Calvi, J. H., Divine, G. W., Stopponi, M. A., Rolnick, S. J., ... & Johnson, C. C. (2010). A randomized clinical trial evaluating online interventions to improve fruit and vegetable consumption. *American Journal of Public Health, 100*, 319–326.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analysis. *British Journal of Social Psychology, 40*, 471–499.
- Arigo, D., Suls, J., & Smyth, J. M. (2012). Social comparisons and chronic illness: Research synthesis and clinical implications. *Health Psychology Review, 1*–61.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Banks, S. M., Salovey, P., Greener, S., Rothman, A. J., Moyer, A., & Beauvais, J. (1995). The effects of message framing on mammography utilization. *Health Psychology, 14*, 178–184.
- Bartels, R. D., Kelly, K. M., & Rothman, A. J. (2010). Moving beyond the function of the health behavior: The effect of message frame on behavioural decision-making. *Psychology & Health, 25*, 821–838.
- Blanton, H., Cooper, J., Skurnik, I., & Aronson, J. (1997). When bad things happen to good feedback: Exacerbating the need for self-justification with self-affirmations. *Personality & Social Psychology Bulletin, 23*, 684–692.
- Borland, R., & Hill, D. (1997). Initial impact of the new Australian tobacco health warnings on knowledge. *Tobacco Control, 6*, 317–325.
- Bourgeois, M., & Bowen, A. (2001). Self-organization of alcohol-related attitudes and beliefs in a campus housing complex: An initial investigation. *Health Psychology, 20*, 434–437.
- Brock, T. (1965). Communicator-recipient similarity and decision change. *Journal of Personality & Social Psychology, 1*, 650–654.
- Brown, J. D., Novick, N. J., Lord, K. A. & Richards, J. M. (1992). When Gulliver travels: Social context, psychological closeness, and self-appraisals. *Journal of Personality & Social Psychology, 62*, 717–727.
- Brug, J., Steenhaus, I., Van Assema, P., & De Vries, H. (1996). The impact of a computer-tailored nutrition intervention. *Preventive Medicine, 25*, 236–242.
- Bull, F. C., Kreuter, M. W., & Scharff, D. P. (1999). Effects of tailored, personalized, and general materials on physical activity. *Patient Education & Counseling, 36*, 181–192.
- Bunde, M., Suls, J., Martin, R., & Barnett, K. (2006). Hystersisters online: Social support and social comparison among hysterectomy patients on the Internet. *Annals of Behavioral Medicine, 31*, 271–278.
- Buunk, B. P., Collins, R. L., Taylor, S. E., VanYperen, N. W., & Dakof, G. A. (1990). The affective consequences of social comparison: Either direction has its ups and downs. *Journal of Personality & Social Psychology, 59* (6), 1238–1249.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality & Social Psychology, 42*, 116–131.
- Cacioppo, J. T., Petty, R. E., & Morris, K. J. (1983). Effects of need for cognition on message evaluation, recall, and persuasion. *Journal of Personality & Social Psychology, 45*, 805–818.
- Cameron, L. D. & Chan, C.K.Y. (2008). Designing health communications: Harnessing the power of affect, imagery, and self-regulation. *Social & Personality Psychology Compass, 2*, 262–282.
- Carmack-Taylor, C. L., Kulik, J., Badr, H., Smith, M., Basen-Engquist, K., Penedo, F., & Gritz, E. R. (2007). A social comparison theory analysis of group composition and efficacy of cancer support groups. *Social Science & Medicine, 65*, 262–273.
- Cialdini, R. B. (1980). Full-cycle social psychology. In L. Bickman (Ed.), *Applied social psychology annual* (Vol. 1, pp. 21–47). Beverly Hills, CA: Sage.
- Cohen, S., Lichtenstein, E., Prochaska, J., Rossi, P., Gritz, E., Carr, C. R., ... & Ossip-Klein, D. (1989). Debunking myths

- about self-quitting: Evidence from ten prospective studies of persons who attempt to quit smoking by themselves. *American Psychologist*, 44, 1355–1365.
- Collins, L. M., Murphy, S. A., Nair, V., & Strecher, V. (2005). A strategy for optimizing and evaluating behavioral interventions. *Annals of Behavioral Medicine*, 30, 65–73.
- Collins, R. L. (1996). For better or for worse: The impact of upward social comparisons on self-evaluations. *Psychological Bulletin*, 119, 51–69.
- Correll, J., Spencer, S. J., & Zanna, M. P. (2004). An affirmed self and an open mind: Self-affirmation and sensitivity to argument strength. *Journal of Experimental Social Psychology*, 40, 350–356.
- Crocker, J., Niiya, Y., & Mischkowski, D. (2008). Why does writing about important values reduce defensiveness? Self-affirmation and the role of positive, other-directed feelings. *Psychological Science*, 19, 740–747.
- Detweiler, J. B., Bedell, B. T., Salovey, P., Pronin, E., & Rothman, A. J. (1999). Message framing and sunscreen use: Gain-framed messages motivate beach-goers. *Health Psychology*, 18, 189–196.
- Dillard, A. J., McCaul, K., Kelso, P. D., & Klein, W. M. P. (2006). Resisting good news: Reactions to breast cancer risk information. *Health Communication*, 19, 115–123.
- Elliot, A. J. & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality & Social Psychology*, 82, 804–818.
- Epton, T., & Harris, P. (2008). Self-affirmation promotes health behavior change. *Health Psychology*, 27, 746–752.
- Festinger, L. (1954a). A theory of social comparison processes. *Human Relations*, 7, 117–140.
- Festinger, L. (1954b). Motivation leading to social behavior. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 191–218). Lincoln, NE: University of Nebraska Press.
- Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behavior. *Psychological Bulletin*, 111, 455–474.
- Gallagher, K. M. & Updegraff, J. A. (2012). Health message framing effects on attitudes, intentions and behavior: A meta-analytic review. *Annals of Behavioral Medicine*, 43, 101–116.
- Gerend, M., & Maner, J. (2011). Fear, anger, fruits, and veggies: Interactive effects of emotion and message framing on health behavior. *Health Psychology*, 30, 420–423.
- Giner-Sorolla, R. (1999). Affect in attitude: Immediate and deliberative perspectives. In S. Chaiken & Y. Trope, (Eds.), *Dual-process theories in social psychology* (pp. 441–461). New York: Guilford Press.
- Goethals, G. R., & Darley, J. M. (1977). Social comparison theory: An attributional approach. In J. Suls & R. Miller (Eds.), *Social comparison processes: Theoretical and empirical perspectives* (pp. 259–278). Washington, DC: Hemisphere.
- Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality & Social Psychology*, 79, 701–721.
- Griffin, D. W. & Harris, P. R. (2011). Calibrating the response to health warnings: Limiting both overreaction and underreaction with self-affirmation. *Psychological Science*, 22, 572–578.
- Hammond, D., Fong, G. T., McDonald, P. W., Cameron, R., & Brown, K. S. (2003). Impact of graphic Canadian warning labels on adult smoking behavior. *Tobacco Control*, 12, 391–395.
- Hansen, W. & Graham, J. (1991). Preventing alcohol, marijuana and cigarette use among adolescents: Peer resistance training versus establishing conservative norms. *Preventive Medicine*, 20, 414–430.
- Harris, P., Mayle, K., Mabbott, M., & Napper, L. (2007). Self-affirmation reduces smokers' defensiveness to graphic on-pack cigarette warning labels. *Health Psychology*, 26, 434–446.
- Hassan, L.M., Shiu, E., Thrasher, J. F., Fong, G. T., & Hastings, G. (2008). Exploring the effectiveness of cigarette warning labels: Findings from the United States and United Kingdom Arms of the International Tobacco Control (ITC) Four Country Survey. *International Journal of Nonprofit & Voluntary Sector Marketing*, 13, 263–274.
- Higgins, E. T. (1999). Promotion and prevention as a motivational duality: Implications for evaluative processes. In S. Chaiken & Y. Trope, (Eds), *Dual-process theories in social psychology* (pp. 503–525). New York: Guilford Press.
- Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: A conceptual, theoretical and empirical overview. *Health Education & Behavior*, 34, 777–792.
- Holt, C. L., Clark, E. M., Kreuter, M. W., & Scharff, D. P. (2000). Does locus of control moderate the effects of tailored health education materials? *Health Education Research*, 15, 393–403.
- Houston, T. K., Allison, J. J., Sussman, M., Horn, W., Holt, C. L., Trobaugh, J.,...& Hullett, S. (2011). Culturally appropriate storytelling to improve blood pressure. *Annals of Internal Medicine*, 154, 77–84.
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change*. New Haven, CT: Yale University Press.
- Ito, T., & Cacioppo, J. T. (2001). Affect and attitudes: A social neuroscience approach. In J. P. Forgas, (Ed.), *Handbook of affect and social cognition*, (pp. 50–74). Mahwah, NJ: Erlbaum.
- Janis, I., (1967). Effects of fear arousal on attitude change: Recent developments in theory and experimental research. *Advances in Experimental Psychology*, 4, 166–224.
- Jessop, D., Simmons, L., & Sparks, P. (2009). Motivation and behavioral consequences of self-affirmation: A study of sunscreen use among women. *Psychology & Health*, 24, 529–544.
- Johnson, B. T., & Eagly, A. H. (1989). Effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin*, 106, 290–314.
- Klein, W. M. P. (1997). Objective standards are not enough: Affective, self-evaluative and behavioral responses to social comparison information. *Journal of Personality & Social Psychology*, 72, 763–774.
- Klein, W. M. P., Lipkus, I. M., Scholl, S. M., McQueen, A., Cerully, J. L., & Harris, P. R. (2010). Self-affirmation moderates effects of unrealistic optimism and pessimism on reactions to tailored risk feedback. *Psychology & Health*, 25, 1195–1208.
- Kreuter, M. W., Bull, F. C., Clark, E. M., & Oswald, D. L. (1999). Understanding how people process health information: A comparison of tailored and untailored weight loss materials. *Health Psychology*, 18, 487–494.
- Kreuter, M. W., Strecher, V., & Glassman, B. (1999). One size does not fit all: The case for tailoring print materials. *Annals of Behavioral Medicine*, 21, 276–283.
- Lancaster, T., & Stead, L.F. (1998). Self-help interventions for smoking cessation. *Cochrane Database of Systematic Reviews*. 4, Art. No: CD001118.

- Latimer, A. E., Rench, T. A., Rivers, S. E., Katulak, N.A., Materese, S.A., Cadmus L.,...& Salovey, P. et al. (2008). Promoting participation in physical activity using framed messages: An application of prospect theory. *British Journal of Health Psychology*, 13, 659–681.
- Lee, A. Y., Aaker, J. L., & Gardner, W. K. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality & Social Psychology*, 78, 1122–1134.
- Leventhal, H. (1970). Findings and theory in the study of fear-arousing communications. *Advances in Experimental Social Psychology*, 5, 119–186.
- Leventhal, H., Singer, R., and Jones, S. (1965). Effects of fear and specificity of recommendation upon attitudes and behavior. *Journal of Personality & Social Psychology*, 2, 20–29.
- Li, L., Borland, R., Yong, H-H, Hitchman, S. C., Wakefield, M. A., Kasza, K. A. & Fong, G. T. (2012). The association between exposure to point-of-sale anti-smoking warnings and smokers' interest in quitting and quit attempts: Findings from the International Tobacco Control Four Country Survey. *Addiction*, 107, 425–433.
- Lipkus, I., & Klein, W. M. (2006). Effects of communicating social comparison information on risk perceptions for colorectal cancer. *Journal of Health Communication*, 11, 391–407.
- Lockwood, P. & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality & Social Psychology*, 73, 91–103.
- Mahler, H. & Kulik, J.A. (1998). Effects of preparatory videotapes on self-efficacy beliefs and recovery from coronary bypass surgery. *Annals of Behavioral Medicine*, 20, 39–46.
- Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology*, 19, 469–479.
- Mann, T., Sherman, D., & Updegraff, J. (2004). Dispositional motivations and message framing: A test of the congruency hypothesis in college students. *Health Psychology*, 23, 330–334.
- Markus, H. R. & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion and motivation. *Psychological Review*, 98, 224–253.
- McCool, J., Webb, L., Cameron, L. D., & Hoek, J. (2012). Graphic warning labels on plain cigarette packs: Will they make a difference to adolescents? *Social Science & Medicine*, 74, 1269–1273.
- McGuire, W. J. (1968). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (2nd ed., Vol. 3, pp. 136–314). Reading, MA: Addison-Wesley.
- McQueen, A., Kreuter, M.W., Kalesan, B., & Alcaraz, K. I. (2011). Understanding narrative effects: The impact of breast cancer survivor stories on message processing, attitudes and beliefs among African American women. *Health Psychology*, 30, 674–682.
- Meyerowitz, B. E., & Chaiken, S. (1987). The effect of message framing on breast self-examination attitudes, intentions, and behavior. *Journal of Personality & Social Psychology*, 52, 500–510.
- Morse, S., & Gergen, K. J. (1970). Social comparison, self-consistency, and the concept of the self. *Journal of Personality & Social Psychology*, 16, 148–156.
- Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review*, 110, 472–489.
- Napper, L., Harris, P.R., & Epton, T. (2009). Developing and testing a self-affirmation manipulation. *Self & Identity*, 8, 45–62.
- Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies in Alcohol*, 14, 164–172.
- Petty, R. E., & Cacioppo, J. T. (1979). Issue-involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality & Social Psychology*, 37, 1915–1926.
- Petty, R. E., & Cacioppo, J. T. (1981). *Attitudes and persuasion: Classic and contemporary approaches*. Dubuque, IA: Wm. C. Brown.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality & Social Psychology*, 46, 69–81.
- Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123–205). New York: Academic Press.
- Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality & Social Psychology*, 41, 847–855.
- Petty, R. E., Ostrom, T. M., & Brock, T. C. (Eds.). (1981). *Cognitive responses in persuasion*. Hillsdale, NJ: Erlbaum.
- Ricketts, M., Shanteau, J., McSpadden, B., & Fernandez-Medina, K.M. (2010). Using stories to battle unintentional injuries: Narratives in safety and health communication. *Social Science & Medicine*, 70, 1441–1449.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, 91, 93–114.
- Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin*, 121, 3–19.
- Rothman, A. J., Wlaschin, J. T., Bartels, R. D., Latimer, A. & Salovey, P. (2008). How persons and situations regulate message framing effects: The study of health behavior. In A.J. Elliot (Ed), *Handbook of approach and avoidance motivation* (pp. 475–486). New York: Psychology Press.
- Rothman, A. J., & Salovey, P. (2007). The reciprocal relation between principles and practice: Social psychology and health behavior. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 826–849). New York: Guilford Press.
- Ruiter, R. A., Kok, G., Verplanken, B., & Brug, J. (2001). Evoked fear and effects of appeals on attitudes to performing breast self-examination: An information processing perspective. *Health Education Research*, 16, 307–319.
- Schachter, S. (1982). Recidivism and self-cure of smoking and obesity. *American Psychologist*, 37, 436–444.
- Schneider, T. R., Salovey, P., Apanovitch, A. M., Pizarro, J., McCarthy, D., Zullo, J., & Rothman, A.J. (2001). The effects of message framing and ethnic targeting on mammography use among low-income women. *Health Psychology*, 20, 256–266.
- Schultz, P., Nolan, J., Cialdini, R., Goldstein, N., & Griskevicius, V. (2007). The constructive, destructive and reconstructive power of social norms. *Psychological Science*, 18, 429–434.
- Seiter, R.H., & Gass, J.S. (2010). *Persuasion, social influence, and compliance gaining* (5th ed.). New York: Allyn & Bacon.
- Sheeran, P. (2002). Intention-behaviour relations: A conceptual and empirical review. In W. Stroebe & M. Hewstone (Eds.),

- European review of social psychology*, (Vol. 12, pp. 1–36). London: Wiley.
- Sherman, D., & Cohen, G. (2006). The psychology of self-defense: Self-affirmation theory. *Advances in Experimental Social Psychology*, 38, 183–242.
- Sherman, D., Nelson, L. D., & Steele, C. M. (2000). Do messages about health risks threaten the self? Increasing the acceptance of threatening health messages via self-affirmation. *Personality & Social Psychology Bulletin*, 26, 1046–1058.
- Skinner, C. S., Campbell, M. K., Rimer, B. K., Curry, S., & Prochaska, J. O. (1999). How effective is tailored print communication. *Annals of Behavioral Medicine*, 21, 290–298.
- Slater, M. D., & Rouner, D. (2002). Entertainment-education and elaboration-likelihood: Understanding the processing of narrative persuasion. *Communication Theory*, 12, 173–191.
- Stanton, A. L., Danoff-Burg, S., Cameron, L., Snider, P. R., & Kirk, S. B. (1999). Social comparison and adjustment to breast cancer: An experimental examination of upward affiliation and downward evaluation. *Health Psychology*, 18, 151–158.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, 21, 261–302.
- Strecher, V., McClure, J. B., Alexander, G. L., Chakraborty, B. Nair, V. N., Konkell, J. M., & Pomerleau, O. F. (2008). Web-based smoking-cessation programs: Results of a randomized trial. *American Journal of Preventive Medicine*, 34, 373–381.
- Suls, J., & Green, P. (2003). Pluralistic ignorance and college student perceptions of gender-specific alcohol norms. *Health Psychology*, 22, 479–486.
- Suls, J., Luger, T., & Martin, R. (2010). The biopsychosocial model and use of theory in health psychology. In J. M. Suls, K. W. Davidson, & R. M. Kaplan (Eds.), *Handbook of health psychology and behavioral medicine* (pp. 15–30). New York: Guilford Press.
- Suls, J., Martin, R., & Wheeler, L. (2000). Three kinds of opinion comparison: The Triadic Model. *Personality & Social Psychology Review*, 4, 219–237.
- Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom and with what effect? *Current Directions in Psychological Science*, 11, 159–163.
- Tversky, A. & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453–458.
- Uskul, A. K., & Oyserman, D. (2010). When message frame fits salient cultural-frame, messages feel more persuasive. *Psychology & Health*, 25, 321–337.
- Uskul, A. K., Sherman, D., & Fitzgibbon, J. (2009). The cultural congruency effect: Culture, regulatory focus and the effectiveness of gain-loss framed health messages. *Journal of Experimental Social Psychology*, 45, 535–541.
- Van der Zee, K., Oldersma, F., Buunk, B. & Bos, D. (1998). Social comparison preferences among cancer patients as related to neuroticism and social comparison orientation. *Journal of Personality & Social Psychology*, 75, 801–810.
- Wheeler, L., Martin, R., & Suls, J. (1997). The proxy social comparison model for self-assessment of ability. *Personality & Social Psychology Review*, 1, 54–61.
- Wheeler, L. & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality & Social Psychology*, 62, 760–733.
- Wheeler, L., & Suls, J. (2005). Social comparison and self-evaluations of competence. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 566–578). New York: Guilford Press.
- Wheeler, L. & Suls, J. (2007). Assimilation in social comparison: Can we agree on what it is? *International Review of Psychology*, 20, 31–51.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel processing model. *Communications Monographs*, 59, 329–349.
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, 27, 591–615.
- Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90, 245–271.
- Wood, J. V. (1996). What is social comparison and how should we study it? *Personality & Social Psychology Bulletin*, 22, 520–537.
- Wood, J. V., Taylor, S. E., & Lichtman, R. (1985). Social comparison in adjustment to breast cancer. *Journal of Personality & Social Psychology*, 49, 1169–1183.